NEW TRANSLATION OF SAKUGI

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54) [Title of the invention]

Metal halide lamp device with an air blowing mechanism.

57) [Summary]

[Aim]

A metal halide lamp device that has been equipped with an air blowing mechanism with a long life span wherein the devitrification speed has been suppressed, without causing the colour characteristics to deteriorate, is offered.

[Structure]

By painting reflecting and heat insulating film 3 in one of the sealing moieties of light emitting tube 1 that has been equipped with main electrode 2 in both ends, in such a way that main electrode 2 is surrounded, and installing base 4 wherein air blowing nozzle 5 has been established as one body, in the other opposite sealing moiety in such a way that air blowing nozzle 5 blows towards the upper moiety of the light emitting tube, and establishing heat insulating material 6 in the surface of the upper moiety of the sealing moiety at the side of arrangement of the air blowing nozzle, a metal halide lamp device for horizontal lighting is constituted.

[What is claimed]

[Claim 1]

A metal halide lamp device that has been equipped with an air blowing mechanism, with the characteristic that

in a metal halide lamp device wherein the situation has been arranged that a light emitting tube wherein no outer tube wherein a halogenide that contains at least a rare earth metal, has been established, lights, being arranged horizontally,

an air blowing nozzle for cooling in order to carry out air blowing to the surface of the upper moiety of the light emitting tube, has been established on the sealing moiety of the above mentioned light emitting tube, and

that a heat insulating film has been performed in the surface of the upper moiety of the sealing moiety of the light emitting tube at the side of arrangement of the said air blowing nozzle.

[Detailed description of the invention]

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[Field of use for the industry]

This invention pertains to a metal halide lamp device, and especially to a metal halide lamp device that has been equipped with an air blowing mechanism, that is used with only a light emitting tube, without establishing an outer tube, and that is used as a relatively small light source for video etc.

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[Existing technology]

By characteristic features such as their colour rendering being good and their efficiency of light emission being high, hitherto short arc metal halide lamps that are used with only a light emitting tube, without establishment of an outer tube, are used and penetrating the market as a light source for video appliances wherein an optical system is used, for

instance overhead projectors, liquid crystal projectors of the overhead type, or liquid crystal projection television, and also projectors etc.

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In this way, the situation has been arranged that small metal halide lamps for video that are used only with a light emitting tube, without establishment of an outer tube, obtain good colour properties, arranging the situation that rare earth metal halogenides are used, that they are brought at a large capacity lamp (electric) power as compared with the interior volume of the light emitting tube, and that the vapour pressure of the sealed additives in the light emitting tube get about the same value as that of a metal halide lamp wherein an outer tube has been established.

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[Problems that should be solved by the invention]

Because the lamp power per unit of volume inside the light emitting tube is large, however, the sealed rare earth metal halogenide reacts with the quartz that constitutes the receptacle of the light emitting tube, and at high temperatures, the phenomenon of devitrification occurs in an early stage. Because, in the case that the light emitting tube is placed horizontally and lighted, the upper moiety of the light emitting tube becomes a moiety with a high temperature, devitrification in this moiety is remarkable, and when it

has irradiated a screen as a light source for video, a problem was that also the colour on the screen changes, and that the deterioration of the intensity of illumination is remarkable.

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In order to solve this point, in the past devices wherein an air blowing mechanism to cool the surface of the upper moiety of the light emitting tube had been established, and the situation had been arranged that devitrifcation is suppressed, and the decline of maintenance of the intensity of illumination is reduced, have been proposed.

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When, however, in this way, the situation is arranged that cooling of the surface of the upper moiety of the light emitting tube by air blowing is carried out by establishing an air blowing mechanism, the devitrification of the light emitting tube is suppressed, and also the decline of the rate of maintenance of the intensity of illumination is suppressed, but the air blowing by this air blowing mechanism reduces the temperature, not only the moiety with the highest temperature, but also in the coldest moiety, and a coldest moiety is formed in another moiety. Therefore a problem was that the vapour pressure declines and that from the early beginning of the lighting, colour properties deteriorate.

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This invention has been performed in order to solve the above mentioned problems in an existing metal halide lamp device that has been equipped with an air blowing mechanism, and its aim is to offer a metal halide lamp with a long life span without deterioration of the colour properties, wherein the speed of devitrification has been suppressed.

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[Means to solve the problems and action]

In order to solve the above mentioned problems, this invention is a device that has been equipped with an air blowing mechanism, with the characteristic that in a metal halide lamp device wherein the situation has been arranged that a light emitting tube wherein no outer tube wherein a halogenide that contains at least a rare earth metal, has been established, an air blowing nozzle for cooling in order to carry out air blowing to the surface of the upper moiety of the light emitting tube, has been established on the sealing moiety of the above mentioned light emitting tube, and that a heat insulating film has been performed in the surface of the upper moiety of the sealing moiety of the light emitting tube at the side of arrangement if the said air blowing nozzle.

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When in metal halide lamps that have been constructed in this way, air blowing from the air blowing nozzle is carried out, it is prevented that a coldest moiety is formed in the base of the sealing moiety, or that the coldest moiety of the lower moiety of the light emitting tube is cooled, even if a part of the air that is blown from the nozzle hits the sealing moiety, because the sealing moiety is heat insulated by the heat insulating film that has been established in its surface, and consequently, the speed of devitrification can be suppressed, without causing a deterioration of the colour properties.

0010

[Example of execution]

Below, an example of execution is explained. Figure 1 is a perspective view of an example of execution of the metal halide lamp device of this invention with a partial excision. In the figure, 1 is a light emitting tube, made of quartz, that has been equipped with main electrodes 2 and 2 that are supported in the sealing moieties at both ends, and the interior volume thereof is ca. 0.4 cc, the largest exterior diameter is ϕ 11 mm, the largest interior diameter is ϕ 8.8 mm, and the arc length is established at 5.0 mm, and ca. 1 mg of a mixture of dysprosium iodide, neodymium iodide, caesium iodide with a weight ratio of 4:2:3, and argon and mercury as the starting gas, are sealed in. Now, in one of the sealing moieties, reflecting and heat insulating film 3 of a white oxide is painted in such a way that it surrounds main electrode 2 that has been established at this

side. Moreover, in the opposite sealing moiety, base 4 that has been established as one body with air blowing nozzle 5 in a side moiety, is installed in such a way that air blowing to the surface of the upper moiety of the light emitting tube is carried out by air blowing nozzle 5. Moreover, in the surface of the upper moiety of the sealing moiety that borders on the side of establishment of air blowing nozzle 5, heat insulating material 6 is established, for instance by painting a powder that consists of an alumina-silica mixture (mixing ratio 1:1) with a thickness of ca. 0.2 mm. By the fact that then to the thus constructed light emitting tube 1, its base 4 is glued with the use of a ceramic, reflecting mirror 7 with a parabolic surface, with an infrared transmissive cold mirror, is installed in such a way that it surrounds light emitting tube 1, and to one end of base 4, lead wire 8 for supply of electric power is connected, and to the base moiety of air blowing nozzle 5, nozzle duct 9 for supply of cold air, that consists of silicone rubber, is connected.

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The metal halide lamp device that has been constructed in this way is placed horizontally and lighted by a rectangular wave electronic stabiliser, with the electric power of a 150 W lamp as the rating. From nozzle duct 9 that has been connected with air blowing nozzle 5, 1 liter of cold air per 1 minute is supplied, and from air blowing nozzle 5, it is blow to the upper moiety of the light emitting tube. Hereby, the temperature of 925° C of the upper moiety of the light emitting tube at the time without air blowing, is

reduced to 880° C. On the other hand, the temperature of the lower moiety, 820° C at the time without blowing, becomes 818° C, and does almost not change, and also in the colour properties, the x, y colour co-ordinates (0.290, 0.330) at the time without blowing, do almost not change, in the order of changing to (0.288, 0.327). Consequently, it is possible to suppress the speed of devitrification of the upper moiety of a light emitting tube without causing the colour properties to change.

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When, for comparison with the above mentioned example of execution of this invention, air blowing from the nozzle was carried out in the same way, with the use of a device wherein no heat insulating material had been established in the sealing moiety, and the change of the colour properties was determined, it was observed that the x, y colour co-ordinates changed remarkably by the fact that air blowing is executed, to (0.265, 0.305), and that also the R_a changes from 88 to 70, and it was conformed that the result of the action of the heat insulating material that had been established on the surface of the upper moiety of the sealing moiety in this invention is remarkable.

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Now, the heat insulating material that is established in the surface of the upper moiety of the sealing moiety is not limited to the one of the above mentioned example of

execution, and the same effect was also obtained when it was formed with the use of a slurry with quartz wool and zirconium oxide as the main materials and colloidal silica etc. as the binding agent.

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[Results of the invention]

Because by this invention, as has been explained above, based on the above mentioned example of execution, a heat insulating material is established in the surface of the upper moiety of the sealing moiety at the side of establishment of the nozzle, it is possible to obtain a metal halide lamp device that has been equipped with an air blower, wherein the colour properties were maintained, the devitrification speed was suppressed, and the rate of maintenance of the screen illumination intensity was improved.

[Brief explanation of the figure]

[Figure 1]

is a perspective view that shows a partially excised example of execution of the metal halide lamp device of this invention.

[Explanation of the symbols]

1 light emitting tube

2 main electrode

3 reflecting and heat insulating film

4 base

5 air blowing nozzle

6 heat insulating material

7 reflecting mirror

8 lead wire

9 nozzle duct

Figure 1.

1 light emitting tube

2 main electrode

3 reflecting and heat insulating film

4 base

5 air blowing nozzle

6 heat insulating material

7 reflecting mirror

NEW TRANSLATION OF KANEKO